


Name:			
Enrolment No:			
UPES			
End Semester Examination, May 2024			
Course: Biostatistical Methods in Clinical Research		Semester : IV	
Program: Integrated (B.Sc.)-(M.Sc.) Clinical Research		Duration : 3 Hours	
Course Code: HSCR2022		Max. Marks : 100	
Instructions: Students will be allowed to use non-programmable scientific calculator			
S. No.	Section A	Marks	COs
	Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)		
Q 1	SPSS commands for multiple regression analysis is (a) Analyze -> Linear -> Regression (b) Analyze -> Regression -> Linear (c) Analyze -> Linear Regression (d) Analyze -> Regression Linear	1.5	CO5
Q 2	Which of the following is a one-dimensional diagram: a) Bar Diagram b) Pie Chart c) Cylinder d) A Graph	1.5	CO1
Q 3	Pie Chart represents the components of a factor by a) Percentages b) Angles c) Sectors d) Circles	1.5	CO1
Q 4	The correct relation between Arithmetic Mean (A.M.), Geometric Mean (G.M.) and Harmonic Mean (H.M.) is a) A.M. = G.M. = H.M. b) G.M. \geq A.M. \geq H.M. c) H.M. \geq G.M. \geq A.M. d) A.M. \geq G.M. \geq H.M.	1.5	CO2
Q 5	Geometric mean of two numbers 1/16 and 4/25 is	1.5	CO2

	a) 1/10 b) 1/100 c) 10 d) 100														
Q 6	The value of coefficient of correlation lies between -1 to 1. [True/False]	1.5	CO3												
Q 7	Spearman's formulae for rank correlation coefficient is a) $r = 1 - \frac{6 \sum_{i=1}^n d_i^2}{n(n^2-1)}$ b) $= 1 + \frac{6 \sum_{i=1}^n d_i^2}{n(n^2-1)}$ c) $= 1 - \frac{\sum_{i=1}^n d_i^2}{n(n^2-1)}$ d) $= 1 - \frac{6 \sum_{i=1}^n d_i^2}{n(n^2+1)}$	1.5	CO3												
Q 8	Two numbers within the bracket denote the ranks of 10 students of a class in two subjects (1, 10), (2, 9), (3, 8), (4, 7), (5, 6), (6, 5), (7, 4), (8, 3), (9, 2), (10, 1). The rank correlation coefficient is (a) 0 (b) -1 (c) 1 (d) 0.5	1.5	CO3												
Q 9	The t-test is applicable only when: a) The variate values are independent b) The variable is distrusted normally c) The sample is not large d) All of the above	1.5	CO4												
Q 10	Paired t-test is applicable when the observations in two samples are: a) paired b) correlated c) equal in number d) All of the above	1.5	CO4												
Q 11	Which is not a measure of central tendency (a) Arithmetic mean (b) Geometric mean (c) Harmonic mean (4) Variance	1.5	CO1												
Q 12	Algebraic sum of the deviations of a set of values from their arithmetic mean is zero. [True/False]	1.5	CO2												
Q 13	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>x</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>f</td> <td>4</td> <td>5</td> <td>y</td> <td>1</td> <td>2</td> </tr> </table> <p>If the mean of the distribution is 2.6, then the value of y is (a) 24 (b) 13 (c) 8 (d) 3</p>	x	1	2	3	4	5	f	4	5	y	1	2	1.5	CO2
x	1	2	3	4	5										
f	4	5	y	1	2										
Q 14	The harmonic mean of 4, 8, 16 is (a) 6.4 (b) 6.7 (c) 6.85 (d) 7.8	1.5	CO2												
Q 15	A batsman scores runs in 10 innings 38, 70, 48, 34, 42, 55, 63, 46, 54, 44, then the mean deviation about median is (a) 8.6 (b) 6.4 (c) 10.6 (d) 9.6	1.5	CO2												
Q 16	Coefficient of correlation between observations (1, 6), (2, 5), (3, 4), (4, 3),	1.5	CO3												

Bean no.	1	2	3	4	5	6	7	8	9	10		
Weight (g)	0.7	1.2	0.9	1.4	0.2	1.1	1	0.9	1	0.8		
Length (cm)	1.7	2.2	2	2.3	2.4	2.2	2	1.9	2.1	1.6		

Section D
(2Qx10M=20 Marks)

Q 27	<p>A beverages company produces cold drink with three different colors. One hundred and twenty college students were asked about their preferences. The responses are shown in Table. Do these data show that all the flavors were equally liked by the students? Test your hypothesis at .05 level of significance. (Given that $\chi^2_{0.05}(2) = 5.99$)</p> <p>Table: Preferences of the college students about different brands of cold drinks.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Color</td> <td>White</td> <td>Orange</td> <td>Brown</td> </tr> <tr> <td>Frequencies</td> <td>50</td> <td>40</td> <td>30</td> </tr> </table>	Color	White	Orange	Brown	Frequencies	50	40	30	10	CO4												
Color	White	Orange	Brown																				
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Q 28	<p>The yield of three varieties of wheat (A, B, C) in four separated fields is shown in the following table. Test the significance of difference in the yields of three varieties of wheat. (Given that $F_{0.05}(2, 9) = 4.26$)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>Wheat Variety</td> <td>Field 1</td> <td>Field 2</td> <td>Field 3</td> <td>Field 4</td> </tr> <tr> <td>A</td> <td>12</td> <td>18</td> <td>14</td> <td>16</td> </tr> <tr> <td>B</td> <td>19</td> <td>17</td> <td>15</td> <td>13</td> </tr> <tr> <td>C</td> <td>14</td> <td>16</td> <td>18</td> <td>20</td> </tr> </table>	Wheat Variety	Field 1	Field 2	Field 3	Field 4	A	12	18	14	16	B	19	17	15	13	C	14	16	18	20	10	CO4
Wheat Variety	Field 1	Field 2	Field 3	Field 4																			
A	12	18	14	16																			
B	19	17	15	13																			
C	14	16	18	20																			